| Notice of Allowability | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/092,937 | BRANLUND ET AL. | |
| | Examiner | Art Unit | |
| | Robert W. Wilson | 2616 | |

***-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--***

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *3/6/02*.

2. ☒ The allowed claim(s) is/are *1-97*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

**Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 8/23/02
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

**Examiner's Amendment**

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Referring to claim 49, add "matrix" after "second decomposition" to the following limitation:

"a matrix decomposition processor coupled to receive said preamble data portion of said input data matrix and providing a first decomposition matrix and a second decomposition"

The new limitation will read as "a matrix decomposition processor coupled to receive said preamble data portion of said input data matrix and providing a first decomposition matrix and a second decomposition matrix".

Referring to claim 62, delete the following phase which appears at the end of claim 62:

"Dependent claims are analogous to those for BR3, but descrambled matrix instead of a first decomposition matrix ...."

Referring to claim 75, add "matrix" after "second decomposition" to the following limitation:

"a matrix decomposition processor coupled to receive said preamble data portion of said input data matrix and providing a first decomposition matrix and a second decomposition"

The new limitation will read as "a matrix decomposition processor coupled to receive said preamble data portion of said input data matrix and providing a first decomposition matrix and a second decomposition matrix".

***Allowable Subject Matter***

2. Claims 1-97 are allowed.

The closest prior art are Karnaet (U.S. Patent No.: 6,625,138) and Fukawa (U.S. Patent No.: 5,757,845). Karnaet teaches: Preamble and Data or symbols added together or concatenated followed by spreading or weighting and then transmitting per Figs 4 and Fig 5. Karnaet teaches: utilizing a received signal to determine the preamble through a matched filter. The matched filter is used to decode and de-spread the data or symbols per Fig 6. Fukawa teaches: inputs are sampled which are correlation filtered into vectors which are used to estimate the weights which are then used to despread the data.

The following is an Examiner's statement of reasons for allowance:

Claims 1-97 are considered allowable since when reading the claims in light of the specification, none of the references of record alone or in combination disclose or suggest the combination of limitations specified in the independent claims including:

"demultiplexer separating said input data matrix into a preamble data matrix and information data matrix; a matrix decomposition processor coupled to receive said preamble data matrix and providing a first decomposition matrix and a second decomposition matrix, wherein said first decomposition matrix is substantially orthogonal and said second decomposition matrix is substantially upper triangular; a detector with an input for said first decomposition matrix and using a set of substantially orthogonal preamble vectors to provide a set of detected preamble correlation vector wherein said each detected preamble correlation vector corresponds to one of said plurality of remote units" as specified in claim 1.

"demultiplexer separating said input data matrix into a preamble data matrix and information data matrix; a matrix decomposition processor coupled to receive said preamble data matrix and providing a first decomposition matrix and a second decomposition matrix, wherein said first decomposition matrix is substantially orthogonal and said second decomposition matrix is substantially upper triangular;

a multiplier using element by element multiplication of a base code vector with said first decomposition matrix and providing a descrambled matrix" as specified in claim 13.

"demultiplexer separating said input data matrix into a preamble data matrix and information data matrix; a matrix decomposition processor coupled to receive said preamble data matrix and providing a first decomposition matrix and a second decomposition matrix, wherein said first decomposition matrix is substantially orthogonal and said second decomposition matrix is substantially upper triangular;

a correlator coupled to receive said first decomposition matrix and providing a correlation vector, wherein said correlation vector is a cross-correlation of said first decomposition matrix and a preamble vector uniquely associated with said remote unit" as specified in claim 25.

"receiving said spread signal at said destination remote unit to form an input data matrix; separating said input data matrix into a preamble data matrix and an information data matrix; detecting said preamble in said preamble data matrix" as claimed in claim 32.

"receiver forming an input data matrix with a preamble portion corresponding to said preamble portion of said signals and an information data portion corresponding to said information data portion of said signals; a matrix decomposition processor coupled to receive said preamble data

portion of said input data matrix and providing a first decomposition matrix and a second decomposition; a detector with an input for said first decomposition matrix and using a set of substantially orthogonal preamble vectors to provide a set of detected preamble correlation vectors, wherein said each detected preamble correlation vector corresponds to one of said plurality of remote units" as claimed in claim 49.

"receiver forming an input data matrix with a preamble portion corresponding to said preamble portion of said signals and information data portion corresponding to said information data portion of said signals; a matrix decomposition processor coupled to receive said preamble portion of said input data matrix and providing a first decomposition matrix and a second decomposition matrix; a multiplier using element by element multiplication of a base code vector with said first decomposition matrix and providing a descrambled matrix" as claimed in claim 62.

"receiver forming an input data matrix with a preamble portion corresponding to said preamble portion of said signal and an information portion corresponding to said preamble portion of said signal and an information data portion corresponding to said information data portion of said signal; a matrix decomposition processor coupled to receive said preamble portion of said input data matrix and providing a first decomposition matrix and a second decomposition; a correlator coupled to receive said first decomposition matrix and providing a correlation and a preamble vector uniquely associated with said remote unit" as claimed in claim 75.

"forming an input data matrix at each remote unit, wherein said input data matrix comprises a preamble portion and an information data portion; detecting at each remote unit said associated preamble for said remote unit in said preamble portion" as claimed in claim 83.

Special Note:

It should be noted that the abbreviation QR decomposition appears in the dependent claims. QR decomposition is defined in accordance with Pg 14 of the applicant's specification as follows:

QR decomposition is the multiplication by the product of the Q matrix and the Rx matrix where the Q matrix consists of whitened received data matrix and the Rx consists of the Cholesky Factor matrix. When the complex conjugate of the received preamable Xp is multiplied by QR then QR decomposition is performed per Pg 14 of the applicant's specification.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Conclusion***

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert W. Wilson whose telephone number is 571/272-3075. The examiner can normally be reached on M-F (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached on 571/272-7629. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Robert W. Wilson

Robert W Wilson
Examiner
Art Unit 2616

RWW
5/17/06

DORIS H. TO
SUPERVISORY PATENT EXAMINER
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